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EDITORIAL NOTES

THE BUDGET

OBVIOUSLY the Budget, the provisions of which were announced last week by Sir Kingsley Wood, is not the least important part of our economic war effort. True, the figures of income and expenditure are staggering, but the resiliency and, we may add, the will to sacrifice of the British peoples are remarkable, and in this respect as in all other directions everything will be done that can be done by the individual to curtail the time of modern hostilities with all the suffering they necessarily entail, and bring about the period of peacetime reconstruction when the victory is ours and the crude policy of government by brute force is destroyed. Annual income and expenditure of the nature of four and a half thousand million pounds sterling respectively—irrespective of the unknown size of our American supplies—are almost impossible to comprehend, but the Budget is a bold attempt to arrive at least at something of a balance between the two. The real object of the Budget has been generally recognized—to bring purchasing power down within the limits of the goods available for civilian consumption, and the raising of the income-tax to 10s. in the £ is undoubtedly a symbol of our determination to see the war through and should encourage confidence among our friends across the Atlantic. The plight of those with heavy and unavoidable commitments does, of course, constitute a serious problem which, it is to be hoped, will be considered sympathetically. One has only to think, for instance, of the burdens borne by a comparative youth with no dependents and no responsibilities earning, say, £5 a week and those of a family man earning four times this amount but having heavy commitments by way of rents and rates, insurance premiums, school bills, and the like, to picture the great contrast in the incidence of those burdens.

We are concerned here, however, not with general aspects of the Budget but rather with its likely incidence on the future of the Gas Industry. In his Budget speech in the House of Commons last week the Chancellor of the Exchequer spoke of the inadequacy of a tax on what are called services. It had been suggested that it would not be difficult to raise an annual revenue of £100,000,000 or £150,000,000 from a stiff turnover tax on services expenditure. The word "services," remarked Sir Kingsley Wood, rather connotes something which is accepted but which could possibly be forgone, or at any rate be subject to a special levy in wartime. But, he went on to say, "a services tax includes taxes on essentials such as rents and rates, railway, bus, and train fares, on the consumption of gas, electricity, and water, on warmth and cooking. . . . It seems clear that here you have a tax in respect of which you must obviously make very many exemptions, and the yield from which, even if it were desirable to impose it, would not be anything of the order that is necessary for our purposes to-day." He therefore looked to direct taxation.

It is recognized, of course, that gas, in the provision of heat for both industrial and domestic purposes, is essential to war effort and the maintenance of community morale. Nor must it be forgotten that its production goes hand in hand with the available supplies of raw materials for explosives, aviation spirit, antiseptics, and, indeed, a host of other materials vital to the prosecution of war. It is the aim of the Industry to supply to the community gas at the lowest possible cost and to maintain this supply as far as possible in any and every wartime circumstance—which, of course, costs money in increasing measure. Increases in the price of gas are inevitable and are, we think, generally recognized by the public as being so. But increased cost of gas and lowered purchasing capacity of the community, industrial and domestic, have a double effect in reducing consumption and, therefore, the production for the nation of materials other than gas vital to the successful prosecution of war. There are many what may be termed "ordinary" causes —such as increases in cost of labour, coal, and other raw materials—for increased gas and coke prices, and there are extraordinary, and extraordinarily heavy, causes such as the results of enemy bombing of manufacturing plant and distribution systems. As our columns well testify the Gas Industry has not been in the habit of pleading for Government assistance. It made no special plea, for example, when the Government asked it to produce the maximum possible production of benzole and toluole. Its response to the appeal was voluntary and self-sustained. What one may ask, however, is what this maximum is likely to be with the double effect on reduced gas consumption to which we have referred, together with the direct incidence of enemy bombing. For long the Industry has sought to co-operate to the best of its ability with the Government, and, as is well known, it is under strict statutory control as far as the prices it can charge and the dividends it can pay. To-day, as it always has been, it is all out to help the national effort in every way it can. In the abnormal circumstances of to-day it looks for sympathetic consideration of its difficulties, and is certainly doing everything in its power as an Industry to solve them.

CO-OPERATION EXEMPLIFIED

AT the recent meeting of the Manchester District Association of Gas Engineers—a report of which appeared in last week's "JOURNAL", p. 57—Sir Harry Haig, the Regional Commissioner for the North-West District, spoke of the importance of the Gas Industry to the life of the country at the present time. Heavy air attacks, he said, had brought home to people in a very intimate and immediate way how very much they were dependent on gas supplies. He laid emphasis on the fact that if there is a shortage of gas, or if the supply is interrupted owing to enemy attack, it at once affects the working of industry because so many industrial processes are dependent on gas supply. "Domestic cooking," he continued, "was also held up, and there was nothing more disturbing to the life of a people than to have their feeding arrangements interfered with. Therefore, from the point of view of maintaining the well-being and morale of the people generally it was of first importance to keep gas supplies functioning." And he paid welcome tribute to the organisation which has been established which "can be fully relied upon to

do everything possible to restore gas supplies immediately after they have been interrupted."

At the same meeting Colonel Carr, who has been appointed Gas Engineering Adviser to the Regional Commissioner for the North-West District, gave details of the organization and spoke of the excellent response from undertakings which had been able to organize mobile repair gangs for their own works and to assist others during the course of recent enemy attacks. In some cases the mobile repair equipment and personnel have travelled distances of 30 to 40 miles in order to render assistance in "blitzed" areas within the shortest possible space of time, certainly within hours of the cessation of an enemy attack. The aim now is so to improve the organization that not only will there be mains gangs available, but there will be provision of such skilled labour in the various works that it will not be necessary to call upon outside assistance to any great extent. That is a good example of co-operation from within. There are, of course, many more. It is indicative of the spirit animating the Industry at the present difficult time. The meeting of the Manchester Association and also that of the North British Association of Gas Managers appeal strongly to us as votes of confidence in the future. Both meetings were, under the conditions of war, excellently attended.

COMPANY MEETINGS AND RESULTS

THE position has now been somewhat clarified and, as stated in the N.G.C. Press Report for April, the Minister of Information has made it clear that, so long as accounts are not published, there is no objection to the holding of annual general meetings. In the meantime the "JOURNAL" has been in a somewhat anomalous position. Having consulted the Ministry on the subject quite early on—before, perhaps, even its own ideas were entirely crystallized—we agreed to abstain from publishing certain company meeting reports for which we had instructions from the undertakings concerned, at precisely the same time as they were appearing in other sections of the Press —national, local, and trade. Unquestionably there was confusion on the whole matter, and we do not dispute in the slightest the Ministry's superior knowledge as to what information may or may not be "of value to the enemy." But we take this opportunity of apologizing to those undertakings which had intended reports of their meetings to appear in the columns of the "JOURNAL" and whose instructions we were unable to carry out.

Perhaps it is as well to explain at the same time the rather attenuated condition in which "Undertakings Results" appear this year in our columns. Here, again, we have had the close collaboration of the Censor in deciding what information should, for safety's sake, be omitted. In the result, one of our most popular features at this time of the year has suffered severely, but again our readers, with this explanation, will know the reason why.

"BRANDED GOODS"

A REPRINT from *The Times* bearing the above heading, to which our attention has been drawn by the Secretary of the Institute of Incorporated Practitioners in Advertizing, emphasizes a matter which is of particular importance to the future trade of the country. The great value of continuous publicity, under ordinary trading conditions, is well understood by the nation's industrial leaders. In connexion with our own Industry, the pages of the "JOURNAL" for ever so many years past have demonstrated the truth of this assertion. And not only is this the case so far as we ourselves are concerned, but in the whole of the National Press, wherever trading announcements may be regarded as having a place; on hoardings in all conceivable positions (only too frequently where such announcements seem to be altogether out of harmony with their surroundings); and in innumerable other directions, attention has been called constantly to branded goods. More recently, of course, there has been the exhortation to " Eat more fish," or oranges, or bananas, or what not—with, the public have been assured, remarkable results. That is general; it is to the particular that we are at the moment desirous of referring. But whether the appeal were in a general or an individual sense, one thing is certain; it would be doomed to failure if it proved to be in an unworthy cause.

Continuous advertising of substantial proportions is an expensive undertaking; and the fact that firms of national repute, in all branches of industry, year in and year out, offer tangible proof of their conviction that it is in the interests of their businesses to invest the big sums of money which are involved in their press advertising, must be regarded as conclusive evidence of its efficacy.

Turn for a few moments to the report of the proceedings at the Annual Meeting of Radiation Limited, which was published in last week's issue of the "JOURNAL." This furnishes a good example of what we have just now in mind. Here will be seen the statement that there are over two million "Regulo" "New World" gas cookers in daily use. It was mentioned at the meeting a year ago that the outbreak of hostilities had interfered with the production of these and other Radiation specialties. Since that time, to quote the remarks of Mr. J. F. F. Davies, the Deputy Chairman (who presided at the meeting reported to-day), "the need to conserve the country's resources, both in men and material, in connection with the great national effort, has been stressed by the Government, and in accordance with that policy the production of all goods which can be regarded as non-essential has been considerably restricted." Proceeding to refer directly to Radiation affairs, he said: "Our output of gas-heated domestic appliances has of necessity decreased still further during the past year, and to-day the menufacture of our specialties is down to a minimum. Although we are unable to satisfy the present demand for 'Regulo' 'New World' gas cookers and our other gas appliances, there is evidence that later on, when we are able to manufacture freely, the demand for our appliances will be considerable, and we are planning accordingly."

Radiation Limited is coming strongly through a difficult period, and, while the Deputy Chairman found it impossible to make a forecast with regard to the Company's trading during the present year, shareholders will applaud his declaration that "our first attention must be given to ensuring that we do all we can to assist in meeting the country's needs."

While, however, the country's needs are the matter of the moment, there will in due course be a return to normal, and from this point of view it is of interest to note the statement lately made in the House of Commons by the President of the Board of Trade that "in many instances where industries were engaged in Government work, manufacturers were keeping their brands in front of the public by means of advertisement. The Government would give all the help they could to keeping these trade marks alive." Commenting, in a letter to the Editor of *The Times*, on this clear expression of Government policy, Mr. Norman Moore, President of the Institute of Incorporated Practitioners in Advertising, says its significance may not be fully appreciated by some manufacturers who are facing the closing-down of their normal production.

Mr. Norman Moore goes on to point out that "British brand names and trade marks are very valuable commercial assets. Some of them have been built up by long years of good trading, by careful maintenance of quality standards, and by substantial investment in advertising. In the aggregate these brand names represent many millions of pounds of shareholders' capital. During the temporary eclipse of his normal production activities, a manufacturer can, and should, protect his brand names—this most valuable goodwill asset—by means of advertising." In other words, the very abnormality of the times renders continuity of advertising rather more, than less, essential, in comparison with peacetime trading conditions.

The Annual General Meeting of the Midland Counties Coke Association will take place at King Edward House, 135, New Street, Birmingham 2, on Thursday, May 1, at 2.30 p.m.

The London and Counties Coke Association will hold the following meetings on Monday, April 21, at Gas Industry House: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m.; Central Committee, 2.30 p.m.

Personal

Mr. C. H. WEBB, who since 1906 has been Engineer of the Stourbridge Gas-Works, is to retire at the end of September. These gas-works have been in existence over a century and have had but three engineers in charge of them. The present Deputy Engineer, Mr. S. J. D. WILLIAMS, is to be Mr. Webb's successor.

* * *

A pleasant ceremony took place recently when the Directors of Messrs. Robert Dempster & Sons, Ltd., Elland, made presentations to three members of their Office Staff who had each completed over 50 years' continuous service with the Firm. The recipients were Mr. GEORGE H. ROBERTSHAW, Director and Secretary; Mr. THOMAS WOOD, Cashier; and Mr. W. S. MITCHELL, Buyer.

Gas Undertaking Dividends

Cheltenham.—5% on consolidated ordinary stock (same).

Kettering.—7% for the year. It was stated at the meeting that the supply of gas had been well maintained, and that a contributory pension scheme and life assurance scheme had been inaugurated by the Directors.

Wisbech.—12% on the ordinary stock (£3 certificates) and 11% on the ordinary £5 shares, per annum.

York.—5% on the consolidated ordinary stock.

Whitby.—The Directors recommended at the Annual Meeting that no final dividend be paid, but in order to make the ratio of the interim dividends strictly conform with the Company's Acts and Orders it was necessary to make an adjusting payment of 10s.% on the interim dividend on the original shares. For the six months dividends on the original and additional shares were at 3% and £2 2s% respectively, and for the second half-year at 3½% and £2 9s.% respectively.

Fleetwood.—Satisfactory trading results were reported at the half-yearly meeting, but the Directors regretted that no dividend could be declared on the ordinary stock. The preference stock is receiving a dividend at the rate of 4%.

Bath.—5% for the year on the consolidated ordinary stock (5½%).

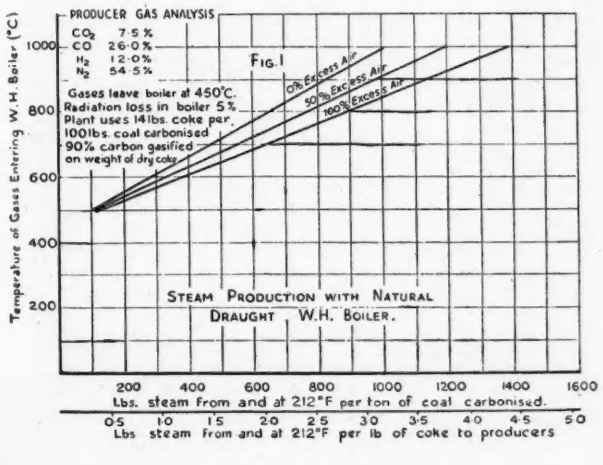
Swindon.—3½% for the December half-year on the consolidated ordinary stock. The Board are continuing their conservative policy in preparation for the period of reconstruction on the termination of the present emergency, when no doubt the Gas Industry would be called upon to make important contributions to the national welfare.

Londonderry.—10% for the past year on the old shares and 7% on the new shares (same).

Perth, W.A.—The accounts of the Perth (W.A.) Gas Department for the year ended Sept. 30 last show that the quantity sold was 431,093,253 cu.ft., which is an increase of a little more than 2% over the 422,444,867 cu.ft. sold in the preceding twelve months. The number of meters in use increased by 1,152, from 25,907 to 27,059, and the total length of mains laid is now 410½ miles. The gross profit is about £3,500 less than in 1939, at £123,804, for the gas and electricity undertakings combined.

Correction

In the "JOURNAL" for April 2 a Paper was published entitled "Waste Heat Recovery in Carbonizing Practice" by Mr. Harold Buckley. It is regretted that the blockmakers omitted to indicate what the curves in fig. 1 represented. A fresh block has been made and is reproduced below in which this error has been corrected. Also in fig. 3, owing to the reduction in size from the original, the figure marked in the block as Radiation Loss should be 7.5%. The decimal point, owing to this reduction, is scarcely visible in the reproduction given in the Paper.


PRODUCER GAS ANALYSIS
CO2 7·5%
CO 26·0%
H2 12·0%
N2 54·5%
FIG. 1
Gases leave boiler at 450°C.
Radiation loss in boiler 5%
Plant uses 14 lbs. coke per 100 lbs. coal carbonised
90% carbon gasified on weight of dry coke
0% Excess Air
50% Excess Air
100% Excess Air
STEAM PRODUCTION WITH NATURAL DRAUGHT W.H. BOILER.
Temperature of Gases Entering W.H. Boiler (°C)
1000
800
600
400
200
200 400 600 800 1000 1200 1400 1600
Lbs. steam from and at 212°F per ton of coal carbonised.
0·5 1·0 1·5 2·0 2·5 3·0 3·5 4·0 4·5 5·0
Lbs steam from and at 212°F per lb of coke to producers

National Gas Council

Meeting of Central Executive Board

A Meeting of the Central Executive Board of the National Gas Council was held at Gas Industry House, 1, Grosvenor Place, London, S.W. 1, on Tuesday, April 8, under the Chairmanship of Sir David Milne-Watson, Bart., LL.D., D.L.

Resignation of Mr. H. D. Madden.—It was stated that a letter had been received from Mr. H. D. Madden, resigning his position as a member of the Board and as Chairman of the South Wales District Executive Board. He had been a member of the Board since 1928, and had been appointed Chairman of the South Wales District in October, 1937. The unanimous opinion of the Board was that Mr. Madden's resignation would be a great loss to the Industry, both from the point of view of the work which he had contributed, and also for his friendly and loyal co-operation.

It was unanimously resolved that Mr. Madden should be nominated as an Honorary Member of the Council.

Coal.—A Meeting of the Central Coal Advisory Committee of the Conjoint Conference of Public Utility Associations on April 4 was reported, and a subsequent deputation to the Secretary for Mines (Mr. D. Grenfell). The Deputation emphasized that the Utilities were carrying a heavy load of responsibility, and that they were anxious and perturbed at the coal situation.

Mr. E. Crowther (Newcastle-on-Tyne) was appointed to take the place of Mr. H. D. Madden (resigned) on the Central Coal Advisory Committee of the Conjoint Conference.

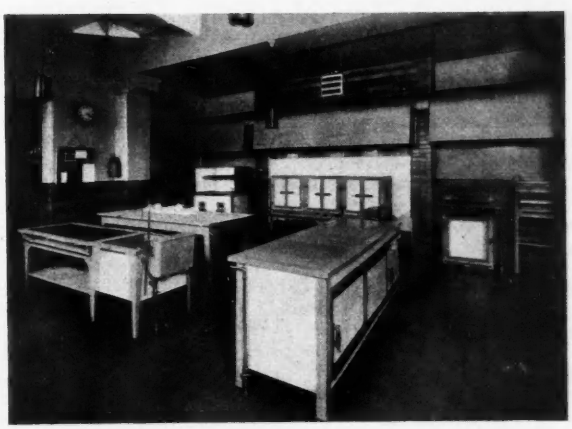
Mains and Cables in Highways—Excavations in and near Bomb Craters.—It was reported that the Conjoint Conference of Public Utility Associations had been in communication with the Ministry of Transport with regard to the responsibility for "making good" the highway where, in order to repair damage to sub-surface works, undertakings find it necessary to break open the highway beyond the craters. The Ministry had now made it clear that the responsibility in such cases would rest upon the Highway Authority.

Public Works Loans Bill.—It was reported that this Government Bill had now practically completed all its Parliamentary stages, and it was thought that it would be interesting and helpful to the managers of local authority gas departments to know of its provisions.

Publication of Annual Accounts of Gas Undertakings and the Holding of Annual General Meetings of Gas Companies.—It was reported that two Orders in Council had been issued with regard to these matters, prohibiting the disclosure of information to the public that might be of value to the enemy. The Ministry of Information had, however, made it clear that, so long as the accounts of the undertaking were not published, there was no objection to the holding of annual general meetings.

The Gas Supply (War Damage) Order, 1941.—It was reported that the Board of Trade had issued a new War Damage Order which repealed the Gas Supply (War Damage) (No. 2) Order, 1940. The new Order, like the repealed Order, dealt with the question of penalties and forfeitures in respect of failure to maintain the declared calorific value.

Date of Next Meeting of the Board.—It was agreed that the next meeting of the Board should take place on May 13.



The Borough of Keighley Gas Department have recently completed the installation of a reconstructed kitchen in the Keighley and District Victoria Hospital. Much of the old apparatus has been discarded and replaced by enamelled cooking equipment from Fletcher, Russell & Co., Ltd. (Radiation, Ltd.), Warrington, comprising the following: Three-oven elevated "Chester" range, No. 507 "Chester" boiling table, No. 217 "Chester" range for special diet cooking, No. 22 double-pan "Wardour" fish-fryer, No. 18 "Savoy" griller on stand, 7-ft. "Warrington" hotcloset, and "Holborn" bain marie. Certain existing appliances, such as steaming ovens, boiling pans, and water boilers have been retained in the new scheme, as have sinks, cupboards, tables, &c. The hospital has 120 beds, including private patients.

North British Association of Gas Managers

SPRING GENERAL MEETING

THE Spring Meeting of the North British Association of Gas Managers was held on Friday, April 4, in the Ca'doro Restaurant, Glasgow. There was a large attendance, presided over by Mr. R. D. KEILLOR, Gas Engineer and Manager, Greenock, President of the Association.

Extending a welcome to those present, the President said the year 1940 would be remembered as the year in which "total war" had been ruthlessly introduced to these islands by the Axis barbarians. We could not but marvel at the lack of real success which had attended the murderous efforts of these evil forces, directed as they were at the morale of our civilian population and at the heart of our industrial machine. He wished to refer briefly to a few of the questions with which they had been concerned during the past year.

First of all, there was the matter of Air Raid Precautions. The Gas Industry had been early alive to the necessity of being prepared to meet all possible emergencies brought about by indiscriminate air attacks, and arrangements had been made up and down the country for the interchange of stores and personnel should occasion arise. It was unnecessary, even if it were permissible, to detail all the arrangements made, but it could be stated in this connexion that the first practical scheme suitable for general application had been drawn up and made available through the medium of the Commercial Section of the North British Association of Gas Managers.

Many other details of Air Raid Precautions had occupied their close attention, and it could not be over-emphasized that experience in severely "blitzed" districts made it imperative that existing arrangements should be continuously reviewed. Additional linkages with other neighbouring undertakings should be effected or existing linkages improved upon wherever possible. In this direction it was advisable that inventories of the surplus gas-producing plant of the various works in each district should be carefully revised from time to time and considered alongside the carrying capacity of existing linkages.

During the past year considerable progress had been made with the formation of a Scottish Coke Association, but it was regretted that 100% co-operation had not as yet been realized. War conditions had not tended to encourage membership of this laudable scheme, which was only now being inaugurated in Scotland. The principles involved had been successfully applied throughout England, and embraced comprehensive technical and market research designed to extend land sales of prepared coke and to provide access to the wealth of technical data and publicity material already available in other centres. These principles, together with a closer bond between producer and distributor and the levelling up of prices which naturally followed 100% co-operation, all had a definite £ s. d. value to the Gas Industry. Although some might not agree, he considered that the time had come for them to get together solidly if a serious slump in coke values was to be avoided when this "all-in" war was won and peace again restored. They were also anxious to put Scotland on a proper footing with the National Federation of Coke Associations, with which the Government preferred to deal in matters affecting cost of production and controlled prices. Let those who had not yet signified their intention of joining the Scottish Coke Association do so without further delay. The one or two pence per ton which it cost to be affiliated to the other coke associations should bring a welcome return before many months had passed. After all, they would only be regularizing their otherwise obscure position in relation to the Federation referred to. Similar arguments could be put forward in connexion with the formation of Industrial Gas Centres for Scotland, and he hoped to see a definite movement in this direction before many months had passed.

The President made reference to the losses sustained by the Association through the death of two Ordinary Members and one Extraordinary Member. Mr. William Kellock, of Kilsyth, died on Nov. 19 last, and his son, Mr. Archibald Kellock, President of the Association, passed away with tragic suddenness on Dec. 2, 1940. Mr. Kenneth Aird, Managing Director of Messrs. R. & A. Main and Thomas Glover, Ltd., died on Jan. 31, 1941.

Members were upstanding in memory of these deceased members.

The President said the proceedings would be incomplete without reference to the main considerations which influenced the Council in their arrangements for the Spring Meeting. At their meeting on Sept. 9 of last year their late President, who had been their Secretary for eleven years, accepted the Presidency with diffidence, and the honour then conferred was unusually acceptable because never before in the long history of the Association had Airdrie's Gas Manager been elected to this responsible office. Then the unexpected happened. It was agreed that the late President's services to the Association demanded every recognition. The Council ultimately decided that in view of all the circumstances Mr. Poulson should be entrusted with the presentation of a description of the Airdrie Gas Undertaking for inclusion in the transactions as a fitting memorial to Mr. Kellock. The arrangements for transferring the venue of the Spring Meeting to Glasgow were acceptable to Airdrie Corporation. The council were also fortunate in obtaining a valuable short Paper from Mr. Bujnowski with a view to providing a discussion on the wartime industrial gas activities confronting the Industry at the present time. The censorship in operation naturally hampered Mr. Bujnowski's choice of subjects, but in spite of this handicap a profitable discussion should follow.

Sir FREDERICK J. WEST, Senior Vice-President of The Institution of Gas Engineers, conveying the greetings of the Institution, said that the activities of the Institution were of necessity curtailed at the present time, but the Council was meeting regularly, the finances were in a sound condition, and membership was being steadily augmented. The new members being added would increase the efficiency and importance of the Institution. They had been compelled to postpone their June and Autumn meetings last year, but they hoped to hold a meeting in June of the present year. A good deal of official business, including the election of office-bearers, had to be transacted, but also they hoped at that meeting to have some short Papers, perhaps limited to 2,000 words each, on some nine or ten subjects in connexion with their present difficulties. He trusted there would be a good representation at that meeting from Scotland. He wished them every success in their work.

The PRESIDENT said they reciprocated Sir Frederick's good wishes and were glad he had been able to be present with them that day.

Nominations

The following were nominated for three vacancies in the Council, two for a period of three years and one for a period of two years, the election to be held at the Annual General Meeting: Messrs. Dow, Kirkcaldy; Farquhar, Fraserburgh; Milne, Aberdeen; Smith, Paisley; Loudon, Grangemouth; Cuthbert, Stirling; Campbell, Galashiels; Lockhart, Rothesay; Cowie, jnr., Hawick; Kirk, Motherwell.

Thereafter Mr. C. A. Poulson read the Paper on "The Airdrie Gas Undertaking"—see last week's "JOURNAL" and our issue to-day.

Proposing a vote of thanks to Mr. Poulson, Provost DAVID GRAY, Airdrie, said he purposed on his return home visiting Mrs. Kellock and letting her know the fine reception which had been given by the members to the Paper, which was written as a memorial to her late husband. Mr. Kellock came to Airdrie 21 years ago, when their gas-works were in a very poor condition. He had worked so assiduously that he reduced their debt charge from nearly £40,000 to £20,000, and even that amount would have been cleared off but for the demands of the income tax people. Continuing, Provost Gray said that recently he had visited three factories. In the first there was a notice "No Admission"; in the second the notice read "No admittance without a permit"; and in the third there was barbed wire to keep people out. But it was different with a meeting of gas engineers, and he thanked them for the privilege of being present and listening to their deliberations. He thanked Mr. Poulson for the Paper they had heard read. He could recall when the Corporation took over the Airdrie undertaking. They paid too much for it and then spent too much on it. Even then they were not so complete as they might have been. But now they had something to show the ratepayers, and they were hopeful that with Mr. Dickson as their new Manager their debt would soon be reduced. If any gas engineer wished to see their plant he would be made welcome.

Bailie A. T. LITTLE, Convener of Airdrie Corporation Gas Committee, seconding the vote of thanks, said they were gratified to find that Mr. Poulson had been selected to write a Paper. The Town Council of Airdrie greatly appreciated the fact that

(*Continued on p. 113*)

EXPERIMENTS ON THE DUSTPROOFING OF COKE

By G. H. FUIDGE, *South Metropolitan Gas Company,*

and

C. H. NOTON, *London & Counties Coke Association*

THE principles of the dustproofing of solid fuels have already been discussed extensively in British technical journals, and reference has recently been made by one of the present writers (1) to the practice of dustproofing, more particularly in the U.S.A., where more than ten million tons of solid fuel including from one to two million tons of coke are dustproofed annually.

The conditions of solid fuel marketing and use in the U.S.A. differ from those in this country. There the fuel is almost invariably stored in basements within the dwelling houses, and these basements are frequently used for other purposes, such as the playing of games. The need for the fuel to be dust-free is, therefore, great. In this country, on the other hand, most modern houses are provided with external fuel bins, and any dust produced at the time of delivery of the fuel is in the open air. In the larger and older houses and in institutions and factories where coke is stored within the building it is unusual for the coke store to house any other activity. Thus the general problem of dustproofing is not so urgent.

With regard to coke, a large proportion of that produced in America is dry-quenched, and before special dustproofing methods were employed it was the practice at many works to spray the coke and the floors of coke storage installations with water to mitigate the dust nuisance. In Great Britain there are very few dry quenching plants, and coke is either water or steam quenched. In the case of the South Metropolitan Gas Company and other members of the London and Counties Coke Association the moisture content of the coke delivered is maintained between 2% and 5%, and under these conditions complaints of dustiness are rare. Even so the possibility that the adoption of dustproofing methods by gas undertakings and other coke producers would lead to an improvement in the product as a domestic fuel, with a corresponding increase in popularity, should not be ignored. It was for this reason that the South Metropolitan Gas Company, at the suggestion of the London and Counties Coke Association, instituted a programme of experiments on the dustproofing of coke. Preliminary laboratory tests only were completed before the work was interrupted by the war, but since there is no published record of any previous experiments in this country on the subject, it is proposed in this note to discuss the results so far obtained. It must be pointed out that these tests were confined to coke from horizontal retorts, water-quenched by the Fleuve process, and that the conclusions reached do not necessarily apply to other types of coke, and particularly to other methods of quenching.

The Dust Nuisance

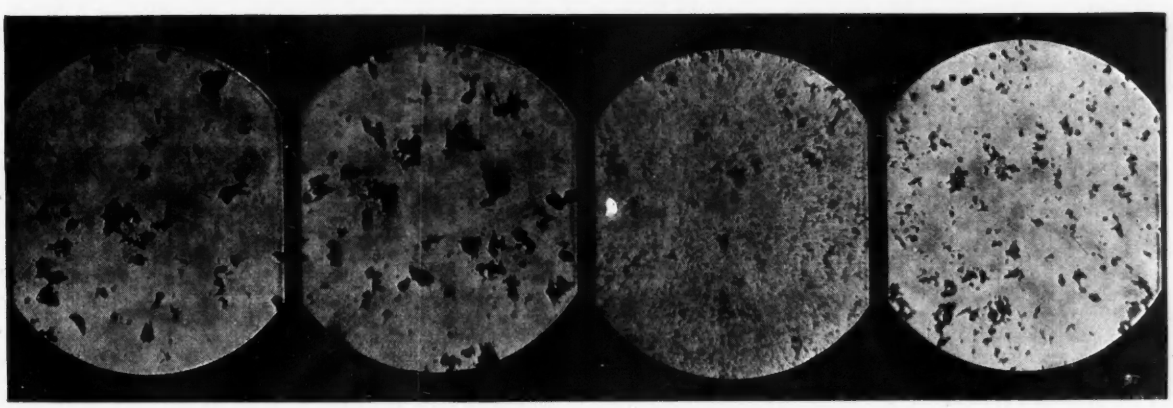
The principal object of dustproofing is the elimination of dust nuisance at all points where coke is handled. The dust nuisance can be conveniently considered as divided into the deposition of (*a*) coarse dust near the point of handling and (*b*) of fine air-borne dust further away. It is obviously impossible to conduct standardized measurements at such indefinite points of dust deposition produced by the handling of fuel in a storage place, and Powell and Russell, of the U.S. Koppers Company,(2) developed an experimental method to reproduce the process of handling and to allow the resultant dust to be collected in a standard way. Briefly, the procedure involves dropping 50 lb. of the fuel through a distance of 5 ft. in a box of special construction and measuring the dust raised by collecting it, upon polished plates pushed into the box, during the first two minutes and during the following eight minutes after the sample is dropped. The weight of dust collected in the two periods, expressed in grammes per metric ton of coke, are called respectively the 2-minute and 10-minute dustiness indices. These give a reasonably accurate measure of the likelihood of nuisance resulting from coarse and fine dust respectively, and the method has been generally adopted by other investigators. Sherman and Pilcher(3) showed by means of micro-photographs the similarity of size between the coal dust particles collected in the dustiness test and those collected close to and distant from a coal bin in a basement. Similar specimens of coke dust, which supported the favourable reputation of the dustiness test, were obtained by one of the Authors and micro-photographs of the specimens are shown in fig. 1. Powell and Russell's test, therefore, has been used throughout the present investigation.

In general there is an almost linear relation between the coarse and fine dustiness indices, the latter being about one-fifteenth of the former. This is shown by the figures in Table I obtained from the experiments to be described. For this reason it is not really necessary to quote the fine dustiness index and, for the sake of simplicity, it has been omitted from the tables that follow.

TABLE I.—Relation Between Coarse and Fine Dust.

A. 2 minute dustiness index.	B. 10 minute dustiness index.	Ratio B—A.
20.7	1.1	0.05
20.7	1.1	0.05
23.8	1.8	0.07
25.1	1.8	0.07
32.1	2.2	0.07
35.2	3.1	0.09
36.5	3.1	0.08
46.2	4.4	0.09
59.4	4.4	0.07
61.6	2.6	0.04
72.4	2.7	0.04
72.6	4.4	0.06
75.6	4.8	0.06
106.0	7.0	0.07
109.6	6.6	0.06

FIG. 1.



2-Minute Dust from Powell & Russell Cabinet — *Dust Collected 4 ft. above Coke Bin.* — *10-Minute Dust from Powell & Russell Cabinet.* — *Dust Collected 20 ft. from Coke Bin.*

A statement of the coarse dustiness index is therefore usually sufficient to define the dustiness of a fuel. In American practice it is accepted that any figure of less than 20 grammes per metric ton represents adequate dustproofing. Further, since the amount of handling that a fuel receives after storage is relatively small, a figure of 40 after three months' storage is usually considered to be satisfactory, and it is understood that this has been supported by large-scale tests.

Dustiness of Normal Coke

In a study of the dustproofing of coke it was necessary first to obtain information on the dustiness of normal domestic coke and the factors affecting the dustiness. With this object in view a number of samples of broken coke (1 in. to 2 in.) were collected from different works of the Company, selecting the samples to cover as wide a range of moisture contents as possible. The samples were tested for dustiness index immediately after delivery at the laboratory. Eighteen samples were tested and 2-minute indices were obtained, ranging from a minimum of 5.3 to a maximum of 46.2, with an average of 13.6. This showed that well-graded wet quenched broken coke was reasonably dust-free as delivered, and this no doubt applied to other sizes.

If the results are arranged in ascending order of moisture content as in Table II, it is seen that the moisture content is an important factor controlling dustiness, and that when the moisture exceeds 3% the dustiness index is always less than the figure of 20 said by the American investigators to represent adequate dustproofing. It is possible that the slight variability of the results independent of moisture content may be connected with the production and handling methods at the different works, but insufficient evidence has as yet been obtained on this point.

TABLE II

Moisture content in coke as delivered. %	Dustiness index.
0.7	20.7
1.4	23.8
1.9	46.2
2.0	36.5
3.0	7.9
3.9	5.1
4.1	6.8
4.9	11.0
4.9	5.3
5.5	15.4
6.0	5.6
6.8	7.9
7.0	3.5
7.0	10.6
8.7	6.6

While it thus appeared that wet-quenched coke was not dusty as delivered, it remained to be determined what occurred when the coke was stored. For this purpose a number of 5-cwt. samples were stored in an unheated but dry building and portions were tested at intervals. The results, which are given in Table III, showed that the coke steadily lost moisture with a consequent increase in the dustiness index. After one week the index increased to about four times the original figure and after a month the increase was of the order of 10 times. After this no further appreciable increase took place. At three months the moisture contents of most samples varied between 0.5 and 1.0%. It will be noted that in certain cases portions of the samples were oven dried, and that with the exception of sample 5 it was only when such drastic drying was carried out that dustiness was found of the order of that reported in American literature. Curves showing the relation between dustiness and moisture content are given in fig. 2. It is also interesting to note that sample 4, which had the low moisture content of 0.7% as delivered, was very much less dusty than other samples which reached this moisture content as the result of drying in storage. The probable explanation of this is that the as-delivered moisture is concentrated on the outside of the lumps of coke, where it exerts a dustproofing influence disproportionate to its magnitude. This is, of course, the principle of dustproofing with calcium chloride which, on account of its hygroscopic nature, maintains on the surface of the coke a thin layer of moisture to which the dust particles adhere.

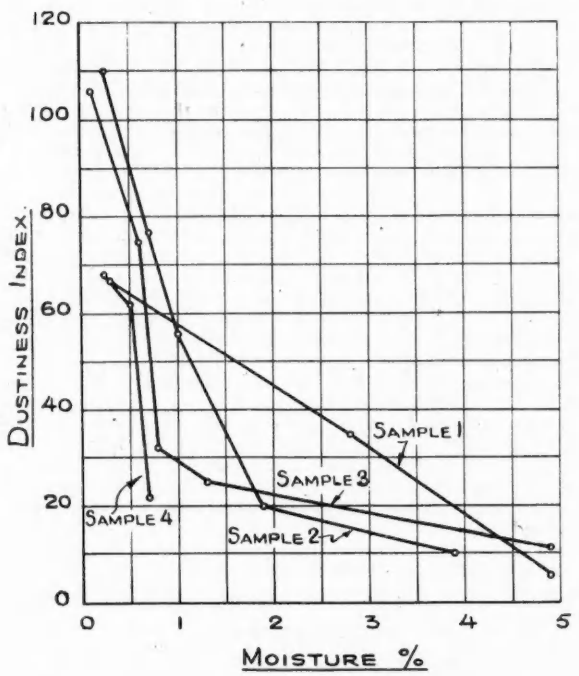
Moist coke, dust-free on delivery, would therefore become more dusty after storage in a dry place, leading to possible dust nuisance when the coke was fired into boilers or transferred into scuttles. Dustproofing might be advantageous in dealing with the dustiness of stored coke, and a series of tests with various dustproofing agents was carried out to examine this aspect of the problem.

TABLE III.

Sample.	As delivered.	After storage				Oven dried.
		1 week.	2 weeks.	1 month.	3 months.	
1. *Works A.*						
Moisture % ...	4.9	2.8	—	—	—	0.3
Dustiness index	5.3	35.2	—	—	—	66.9
2. *Works B.*						
Moisture % ...	3.9	1.9	1.0	1.0	0.7	0.25
Dustiness index	5.1	19.8	55.9	59.4	77.4	109.6
3. *Works C.*						
Moisture % ...	4.9	1.3	0.8	0.6	1.1	0.1
Dustiness index	11.0	25.1	32.1	75.6	72.6	106.0
4. *Works D.*						
Moisture % ...	0.7	0.5	—	—	—	0.25
Dustiness index	20.7	61.6	—	—	—	63.4
5. *Works D.*						
Dustiness index	14.1	55.9	—	136.7	139.0	—
6. *Works D.*						
Dustiness index	4.8	78.3	—	—	—	—
7. *Works D.*						
Dustiness index	8.8	33.0	—	55.0	68.2	—

EFFECT OF DRYING ON DUSTINESS INDEX.

FIG. 2.



Effect of Dustproofing Agents

The materials commonly used for dustproofing solid fuels include mineral oils, emulsions of oils in water and hygroscopic substances, such as calcium chloride. Methods used for dustproofing coke in the United States have been described by Meredith,(4) Fulreader,(5) and Coryell(6). The Rochester Gas and Electricity Corporation use calcium chloride to the extent of 5 lb. per ton applied as an 18% solution, and it is stated that the corrosion of metals with which the coke comes in contact is not unusually severe. The Koppers Company abandoned the use of calcium chloride because of corrosion troubles and turned to the use of oil emulsions, 1.8 lb. of oil per ton being applied as a 6.25% emulsion. It is understood that more recently this Company has adopted the use of high viscosity oils applied by a proprietary process in which the oil is sprayed hot at a high pressure.

The agents used in the present tests were three mineral oils of viscosities 100 sec., 175 sec., and 300 sec. Saybolt at 100°F. respectively, a proprietary concentrated solution type emulsion of very viscous oil (700 seconds Saybolt at 210°F.) which was diluted to a 6.5% emulsion for use and 25% calcium chloride solution. For convenience in these preliminary experiments the spraying was carried out by means of a small air-gun paint spray, using air at 50 lb. pressure, on to the samples of coke

spread in a single layer in a tray and turned several times during the course of the operation. Quantities of 2, 5, and 10 lb. of oil per ton, the equivalent of 2, 5, and 8 lb. of calcium chloride and 2 lb. of the emulsified oil (30 lb. of the emulsion), were applied respectively to 50 lb. samples of coke obtained by increment sampling of a fresh delivery of 2 tons of broken coke. Four lots of coke were treated with each agent at the different rates of application and four were left untreated. The samples were stored in paper bags and tested for dustiness after 1 day, 1 week, 1 month, and 3 months. Separate samples were used for each dustiness test, since it had been found that results were inconsistent if a sample was tested more than once. The method of storing in paper bags was, of course, open to criticism, but it was necessary in order to conserve storage space. Comparative tests showed that the dustiness results obtained were approximately similar to those obtained from 5 cwt. heaps stored in the same building.

The results of the dustiness tests on the samples are given in Table IV, and they are shown graphically in fig. 3. The following observations can be made from them:

1. After one day all the samples, including the untreated coke, are dustproof in that they all have dustiness indices well below 20.
2. The dustiness index of the untreated coke rises as the coke dries, rapidly at first and then more slowly to a value of the order of 100.
3. The effectiveness of all the dustproofing agents examined increases with the quantity used. With the exception of the emulsion, in no case does 2 lb. per ton have any marked effect. 10 lb. per ton in all cases maintains the dustiness index below 20 for a period of three months.
4. The effectiveness of oil increases with the viscosity; 5 lb. per ton of either the medium or the high viscosity oil gives a dustiness index after 3 months of between 20 and 25, well below the figure of 40 said to be satisfactory after that time. Although the heavy oil emulsion was only applied at 2 lb. per ton it was evidently much more effective than any of the straight oils which were less viscous. This might be due to the very high viscosity of the oil, although it might also be explained both by the better distribution of the oil in emulsified form and by the effect of the water (amounting to 1% of the coke) accompanying it.
5. This effect of viscosity is similar to that noted by Sherman and Pilcher[7] and the Fuel Research Station[8] in connexion with the dusproofing of coal. Oils of higher viscosity than those covered in the present tests are now used in America, elevated temperatures and high spraying pressures being used to ensure effective distribution over the surface of the fuel. The explanation of the improved results with coke from high viscosity oils may lie in a reduction in the rate at which the oil film spreads from the outer surfaces to the inner surfaces of the macroscopic pores. In the case of coal[9] it appears that it is the absorption of the oil into the microscopic capillaries in the coal substance that leads to the diminution with time of the effectiveness of dustproofing.
6. Calcium chloride produces a somewhat similar effect to the corresponding quantity of oil, although it does not appear to be quite so effective, 5 lb. per ton being insufficient for adequate dustproofing after 3 months.

TABLE IV.

Dustproofing Agent.	Time. 1 day.	1 week.	1 month.	3 months.
Untreated	8.8	33.0	55.0	68.2
Low Viscosity Oil (100 seconds):				
2 lb. per ton	4.4	16.3	36.1	66.0
5 lb. per ton	6.6	13.2	35.2	36.1
10 lb. per ton	2.2	11.0	14.5	15.4
Medium Viscosity Oil (175 seconds):				
2 lb. per ton	13.2	24.2	44.0	48.4
5 lb. per ton	9.7	13.2	22.0	22.0
10 lb. per ton	8.8	4.4	9.7	15.4
High Viscosity Oil (300 seconds):				
2 lb. per ton	6.6	15.0	42.0	43.0
5 lb. per ton	8.8	6.2	15.9	25.1
10 lb. per ton	3.1	5.3	11.0	12.3
Emulsion "B":				
2 lb. per ton	3.4	5.3	23.3	44.0
Calcium Chloride:				
2 lb. per ton	—	—	35.2	57.2
5 lb. per ton	—	—	40.0	35.2
8 lb. per ton	5.3	7.0	11.0	9.3

Effect of Dustproofing Agents on Combustion

The dustproofed coke has been burned on open fires and in domestic boilers. The coke treated with 2 lb. per ton of oil behaved normally, but that containing greater quantities of oil emitted a definite cloud of white oil vapour for a few minutes after charging. It is unlikely that this would be objectionable on an open fire except in so far as it could no longer be said that the fuel was smokeless, but on domestic boilers a smell of oil might be noticed when the dampers were closed and sticky deposits might be produced in the exposed portions of the flue. As yet no definite evidence has been obtained on this point, but it is interesting to note that the Koppers Company[10] restricted the quantity of oil used in order to avoid possible smoke nuisance.

No smoke was produced, of course, by the calcium chloride treated coke, and this material would have also the advantage of being cheaper than oil. In this case the possibility of corrosion troubles would require careful consideration. Experimental work is required on this subject, particularly as the experience of American workers in this connexion is rather conflicting. However, the use of calcium chloride in other industrial applications—refrigeration brine, coal-washing and so on—has not been associated with any serious corrosion; it has been found that no corrosion occurs if the solutions are

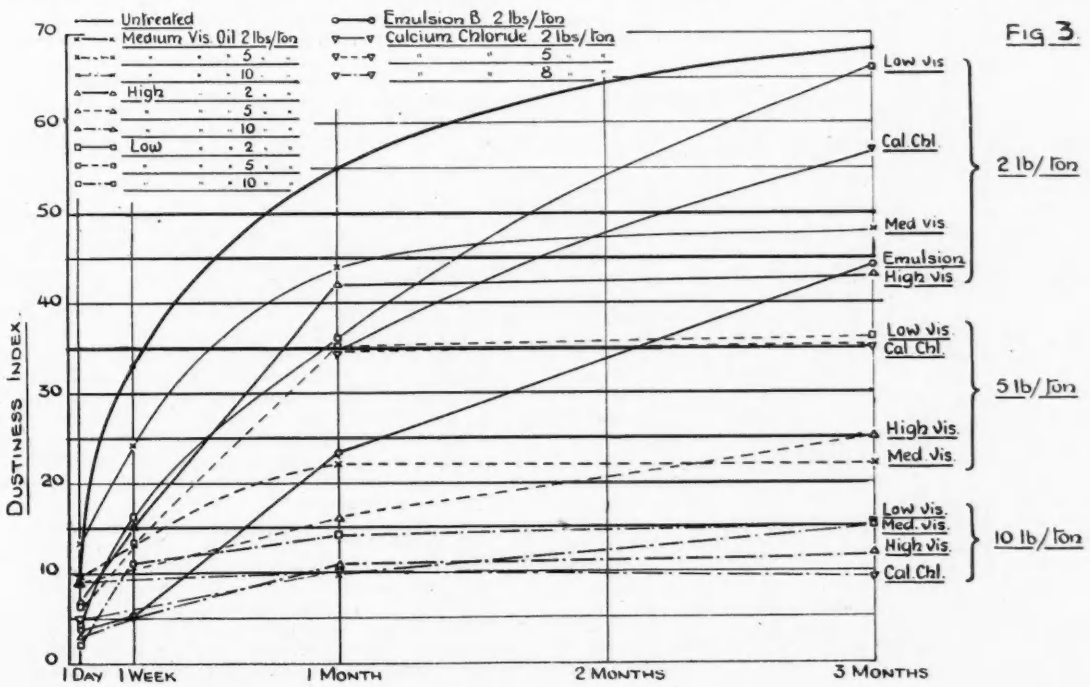


Fig. 3.

kept slightly alkaline by the occasional addition of small quantities of lime.

Cost of Dustproofing

If 5 lb. of oil or 7 lb. of calcium chloride per ton of coke are required for commercial dustproofing, the cost of materials, taking pre-war prices of 8d. per gallon of oil and ¼d. per lb. of calcium chloride, would be about 4d. per ton. On the basis of American practice, labour and overheads should not appreciably exceed 100%, so that the total costs should be under 1s. per ton of coke. As a matter of fact the quantities of dustproofing agent required would probably be less than the above figures in a full-sized plant using direct pressure spraying.

The experience of the Authors in connexion with the marketing of special grades of coke having certain special properties such as high reactivity and low ash content is that the consuming public is prepared to pay a higher price for a fuel that is superior to the normal article, although it has to be convinced that it does possess real advantages. Thus if dustproofed coke constituted a definitely improved product, there should be no difficulty in recovering the cost of the treatment.

Summary and Conclusions

The experiments discussed in this note are admittedly of a preliminary nature only and will need to be extended so soon as the opportunity permits. With this reservation it is felt that the following conclusions can be drawn from them:

1. It is not possible to make out such a good case for the dustproofing of coke in this country as appears to hold in the U.S.A., due chiefly to the difference in the storage conditions. Here it is seldom the case that coke is stored in places which are used for other purposes, and where therefore even a small amount of dust is highly objectionable. At the same time any process that improves the quality and/or increases the popularity of coke as a domestic and industrial fuel requires very careful consideration.

2. Wet-quenched well graded horizontal coke containing at least 3% of moisture is adequately dust-free as delivered, and it is during delivery that it is most likely that dust nuisance will be caused. This freedom from dust may not apply to other types of coke and particularly to other methods of quenching. The dustiness troubles experienced with American cokes appear to have been mainly associated with dry quenching.

3. The dustiness of coke increases with storage under cover, and dust nuisance might occur on subsequent shovelling into furnaces or into scuttles or other containers. This development of dustiness can be prevented by the application by spray of dustproofing agents such as mineral oil or hygroscopic materials, such as calcium chloride.

4. With the simple methods of application used in the experiments freedom from dust after 3 months' storage can be attained by the use of 5 lb. per ton of oil of 200–300 seconds Saybolt at 100°F. The same result could probably be obtained by the use of smaller quantities probably not greatly exceeding 2 lb. per ton of more viscous oil, applied warm or emulsified, using direct high-pressure spraying.

5. Appreciable amounts of oil vapour are evolved on a fire burning coke treated with more than 2 lb. of oil per ton. This might be objectionable in certain circumstances. Calcium chloride is free from this objection, but it might give rise to corrosion troubles.

6. The cost of commercial dustproofing should be less than 1s. per ton. This additional cost would be justified if the process increased the suitability of coke as a domestic fuel.

The Authors' thanks are due to the Directors and General Manager of the South Metropolitan Gas Company and to the London and Counties Coke Association for permission to publish this paper. They also wish to thank Mr. A. Burrell for his help in the preparation of the manuscript. The thanks of the Association are due to the Company for carrying out the experimental work.

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North British Association of Gas Managers

THE AIRDRIE GAS UNDERTAKING

SPRING MEETING, APRIL 4

By C. A. POULSON,
A.M.I.Mech.E., F.C.S.

Eleven Decades of Gas Supply

[In regard to the diagram of the sub-strata on gas-works site (p. 63 of last week's "Journal") the asterisk against "Kingle" on the block should have been accompanied by a footnote to explain that this term meant very hard sandstone cemented with silica.]

(Continued from p. 63)

The retorts, of Messrs. Stein's silica material, are set in units of 2's, the heating and general design permitting independent control of each unit. An enlarged section at the base of each retort, usually referred to as the steaming chamber, presents a large superficial area of coke to the incoming steam to increase the efficiency of the steaming reaction, thus reducing to a minimum the quantity of undecomposed steam passing forward which otherwise, condensing out, would dilute the tar and liquor.

The admission of producer gas to the setting is controlled by a series of plugs with fixed and graduated apertures, which can be interchanged to match correctly the desired heat zoning required for varying classes of coal. This recent development of fuel gas nostrils of definite dimensions ensures a constant input of heat to each combustion chamber with consequent economy in producer fuel. Air is controlled to each chamber by individual slides, which, when adjusted to effect the proper mixture, are secured in position by locking screws.

The bench is provided with two step-grate producers, each capable of supplying fuel gas to six retorts, and a common gas-collecting flue enables either producer to feed any of the heating units. Each is fitted with pressure equipment, with the West multi-nozzle steam-air blower, which enables de-dusted breeze to be used as producer fuel.

The use of breeze in producers has now become established, and a wide range of experiments, a number of which have been carried out in Scotland, has shown that the size of coke is unimportant providing that the majority of the dust is removed. The object of removing the dust, roughly that fraction through a ¼-in. mesh, is to obviate channelling in the fuel bed, and to ensure an even distribution of steam/air mixture over the entire area of the grate. Besides the financial advantage accruing from the consumption of breeze, the pressure producer also gives a more flexible control of the setting, and when insufficient breeze is available, each unit can be readily operated under natural draught conditions.

Waste-Heat Recovery

A Spencer Bonecourt induced-draught waste-heat boiler is installed to raise steam by utilization of the major portion of heat in the exit gases from the setting. Provision is made in the brickwork of the retort setting to allow a volume of producer gas to be by-passed direct to the waste-gas flues in order to augment the production of steam when required.

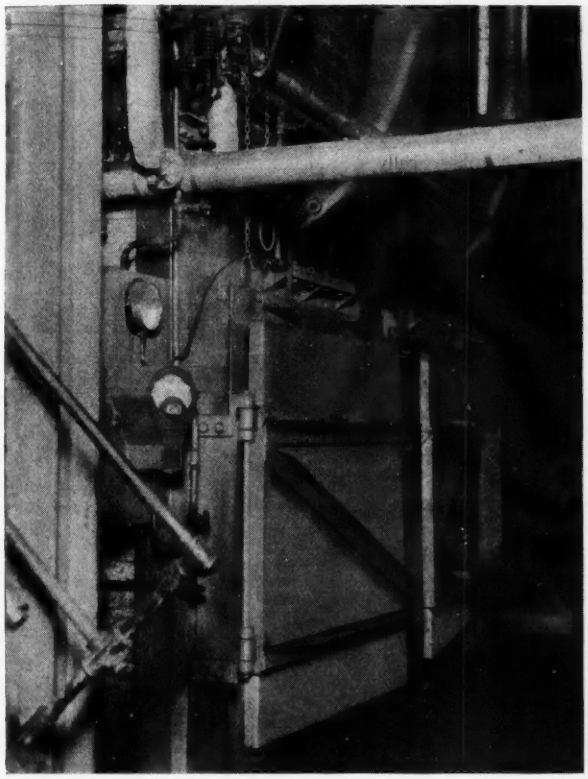
The boiler operates at a pressure of 120 lb. per sq. in., and the fan unit is driven by a direct-coupled steam turbine. Town water is used, pre-heated to a temperature of about 190°F. by means of a feed-water heater through which the exhaust steam from the turbine passes.

The feed pumps, in duplicate, are manufactured by Messrs. G. & J. Weir, and the boiler is completely rigged with the well-known "Thermofeed" and "Hilo" automatic water control arrangements, superheater, &c.

Mechanical Coal and Coke Handling

Coal is delivered to the works siding, which is served by the London & North-Eastern Railway Company, and the wagons are shunted along the elevated gantry. Every opportunity has been taken to realize the economies of mechanical handling, to which continuous vertical retorts so readily lend themselves. Coal is discharged from the railway wagons into a large receiving

hopper below the gantry and thence into a single-roll coal breaker capable of reducing 40 tons of coal per hour to pieces not exceeding 2 in. cube. A by-pass chute is arranged for nuts so that when this class of fuel is being used the breaker is out of operation.

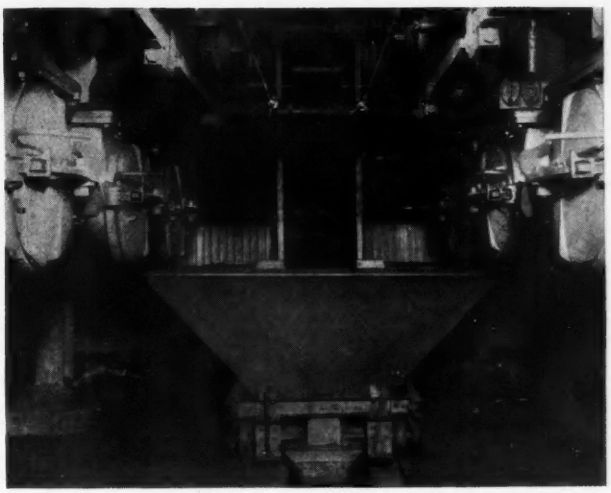


Fuel-Gas Producers with Pressure Equipment.

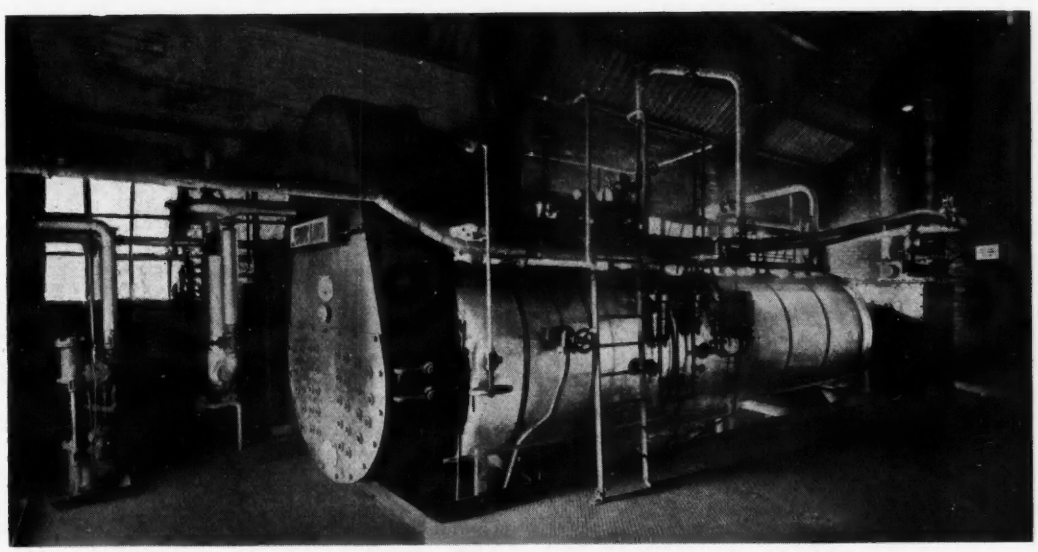
The coal is received by the lip-bucket conveyor encircling the retort house, and delivered to overhead storage bunkers of 48 hours' capacity. The conveyor is automatically force-lubricated, and is driven, along with the breaker and feeder gear, by a 35 h.p. totally-enclosed steam engine. A series of friction clutches is suitably arranged to put each unit in or out of action at will.

Coke is discharged from the retorts direct into the lower

Coke Handling by Old Method.



Coke Handling by New Method.



The Waste-Heat Boiler.

strand of the conveyor, which is below floor level, and elevated into a 50-ton hopper. This hopper is placed above the railway siding so that railway wagons can be readily supplied with screened coke. The screen (of the static type) is placed below the discharge of the conveyor, ensuring that a supply of clean coke is always available for railway wagons, and, if required, can be taken away by the same shunt as that in which coal is brought into the works.

A section of the hopper is reserved for coke for producer-feed and for retort-filling. The coke screenings are deflected to another section over a smaller static screen. This fraction is thus de-dusted for use in the producers.

Retort-House Building and Engine House

The building is of steel-frame design, the panels being filled in with bricks manufactured locally. Ample daylight is provided for by a generous arrangment of roof and side glazing. The extension end gable is sheeted to allow easy addition to the plant when extension becomes necessary. The engine house, which has been tiled, is adjacent to the retort house. It contains the driving engine for the conveyor and two extractor driving engines, acting as stand-by to one another, all of totally-enclosed type.

Gauges and pressure indicators within the retort house, as far as possible, are grouped, one set being at the stack level, and the other contained in a glazed cabinet at floor level.

Conclusion

In the foregoing an endeavour has been made to render a straightforward account of the Airdrie Gas Undertaking. It inevitably lacks any adequate expression of the capable personality which lay behind it.

It is the story of a thoroughly healthy undertaking, well organized, economically conducted, competently managed, and vigorously directed with one end in view, the interests of the gas consumers and ratepayers of Airdrie. My task will have been accomplished if I have succeeded in showing that Airdrie Gas-Works, and indeed the Airdrie Gas Undertaking as a whole, has been placed firmly on the road of progress and orderly development by the engineering acumen and managerial ability of Archibald Kellock.

Gas Industry and the Post Office

HOW one public service helps another was the theme that prompted us to accept a recent invitation from the Public Relations Department to learn something of how the Post Office is tackling the many tasks that inevitably confront it to-day. The work of this Department of State touches life at all points, here and abroad, in peace and in war, and in recent months the Department has shared with gas and other public utilities the pressing problems of maintaining vital services under adverse conditions. There have certainly been criticisms of interrupted telephone, telegraphic, and other facilities, but the Post Office has done a fine job of work in helping the wheels of industry to gain an ever-increasing momentum, and it is appropriate now to take stock of the ways in which the Gas Industry utilizes the services of the Department.

The telephone service is perhaps of outstanding interest. We recently mentioned how the London Regional Gas Centre, which deals with emergencies in the combined area of 15 large gas undertakings, covering a population of 9,250,000, depended upon 600 telephones on 150 exchanges for messages passing between the report and control centre, works and depots, and had some 400 miles of private telegraph lines available for communication. Gas undertakings can secure preferential treatment in respect of the installation of new lines in suitable cases if representations are made to that effect when they are ordered. The lines of public utility companies are listed by the Post Office, without application from the companies concerned, for preferential treatment in respect of repairs. In this connection, however, it should be added that it is often impossible in practice to differentiate as to the order in which subscribers' lines are restored to service after damage. Where a cable has been cut it is often quicker to repair all the lines in it than to attempt to sort out those which serve subscribers entitled to preferential repair service in order to give them attention first.

Gas-works requiring to put through urgent telephone calls to plant makers or repairers should book their calls in the ordinary way, and every endeavour is made to complete them. If the call cannot be effected the caller is so informed, but the operator has no means of knowing or of ascertaining whether the failure of the call is due to damage to telephone plant or damage to the premises of the called subscriber. The latter point is one on which the telephone service is not in a position to supply information. There are many ways in which temporary numbers are recorded in the telephone service, a description of which would be too lengthy and technical, but the directory inquiry department is always willing to help callers to establish contact with those to whom they wish to speak.

One other point about the telephone service is that subscribers in the (London) Central and City exchange areas are now able to "dial" subscribers in some 21 or more suburban areas without using the "Toll" exchange. A word of warning, however, is necessary here. The dialling for most of these outlying districts involves a departure from the usual method of using the first three letters of the exchange name followed by the four figures. Details are obtainable from the telephone service; they are quite simple, and will be found to afford a big advantage over the old method of using the already overworked "Toll" system.

The original function of the Post Office was to carry mails, and this side of its work is likely to be of increased service to the Gas Industry during wartime, particularly in connection with the distribution of accounts and the collection of money. Already many of the larger undertakings send their accounts by post, and more will probably do so as their staffs of non-vital personnel become depleted. The Post Office will have no objection to full use being made by gas undertakings in their present difficulties of the facilities which it provides for the public generally. In the case of large postings of accounts, &c., certain special facilities are available which relieve the sender of the necessity of using ordinary postage stamps. These are fully described in the Post Office Guide, and any local Head Postmaster would be pleased to assist with his advice. The use of Business Reply Cards which consumers could use for reporting defects would also receive the blessing of the Post Office. Full particulars of this service are given in the Post Office Guide and in special leaflets.

Here is an economy idea. Accounts can be sent through the post without envelopes, but they must conform to certain general rules as regards folders. The main points to be observed are that they must be so folded as to provide for a tuck-in flap, that the folded edge is on the right-hand side, and that when made up for posting they must not be less than 4 in. in length—4 in. by 2¾ in.—or greater than 6 in. by 4½ in. To be admissible at the Inland Printed Paper Rate the forms must be appropriately printed and comply with regulations published in the Guide and in a separate leaflet obtainable from the Post Office. It may be well also to mention that cheques, whether crossed or not, cannot be sent by the printed papers post—*i.e.*, in open envelopes or folders. Most people are employing stick-on labels nowadays to utilize once-used envelopes. The Post Office points out that this is permissible only for inland posting.

The usefulness to the Gas Industry of the banking side of the Post Office—savings, money orders, postal orders, &c.—is perhaps a little less obvious, though the payments remitted by consumers through these channels amount to many thousands of pounds a year. Many ordinary consumers put money aside week by week to meet their quarterly accounts, and the savings bank affords a convenient method of doing this and at the same time contributing something to the national savings movement. The popular "Home Safe" is at present in short supply, but the smaller saver is catered for by the provision of stamp savings books. The Department could not urge that the manufacture of the safes was essential to the war effort, with the result that key men have been withdrawn from the industry and supplies of safes are now insufficient.

There are no facilities for paying gas bills direct through the savings bank as there are for telephone accounts, but the crossed withdrawal warrant made payable to a third party is a simple substitute for those who have no ordinary banking accounts and live at a distance from the gas undertaking's offices. Most undertakings include hire purchase payments in their quarterly gas bills, with the result that the amount varies from quarter to quarter, but where the amount is fixed, the department can be of assistance. It does not accept standing instructions to make payments from a savings bank account in connexion with hire purchase agreements, but it makes a charge of 4d. per payment, payable yearly in advance, and the payments must be of regular amounts.

Carry On!

Tribute is paid to the way in which the Gas Industry is carrying on under war conditions in an article headed " The Therms and Watts Carry On " in the March issue of the *Protector*, the journal of Wailes Dove Bitumastic, Ltd. Before the war began, says the article, there were many "experts" who forecast that both gas and electricity would be crippled by bombing from aircraft. And the Germans themselves may have had the same idea until it was blown out of them by our Spitfire and Hurricane pilots. The Gas Industry, in fact, has good grounds for real pride in its achievements. Despite the hail of bombs directed at gas making plants and street mains, the damage and interruption of supplies has been remarkably slight. An interesting sidelight to this war against gas supplies is provided by the periodic German claims that "a gasholder at ——, after being hit by bombs, was observed to explode." The simple truth is that British gasholders cannot explode at all. Another article in the same issue deals with "Nature's Fifth Column"—corrosion—which costs industry many millions of pounds a year. The only effective way of defeating it is to prevent it ever getting to work. The means are ready to hand in the form of the company's products.

(*Concluded from p.* 100)

the Paper was a memorial to their late Gas Manager. It was an honour to the late Mr. Kellock and also to Airdrie Corporation.

Replying, Mr. POULSON said he was greatly indebted to their President and to Mr. Sturrock, their Secretary, for the help they had given him in the preparation of the Paper. He wished also to acknowledge the assistance received from Airdrie Gas Committee and the Airdrie Town Clerk.

Luncheon Speeches

At the subsequent luncheon Mr. R. D. KEILLOR presided.

Proposing the toast of "The Gas Industry," Sir P. J. DOLLAN, Lord Provost of Glasgow, acknowledged receipt of a cheque for over £27 received from the members for his Clydeside Relief Fund. He hoped, he said, in a few days to be able to announce that the £200,000 figure had been reached.

Replying, Sir FREDERICK J. WEST said his visit North allowed him to convey the greetings of The Institution of Gas Engineers, to visit many old friends, and also to see his own son, stationed with the R.A.F. in Scotland. The war was severely testing the adaptability and technical skill of their Industry. If ever the story of what gas did in the war came to be written, it would be a most creditable record. But their Industry was not being sufficiently recognized by the Government. It was an essential service and in the matter of control deserved more recognition, especially so far as the retention of labour was concerned. The Industry had shown its flexibility and adaptability to a marked degree and was carrying on in a very satisfactory manner. It was wonderful to see how gas engineers had applied themselves to the problems of the war and had given up for the time being other technical matters so that they might work to the orders of the Government. More than ever before gas engineers were co-operating with each other. The Industry was making a right and proper contribution to ultimate victory.

Mr. JAMES BELL, Dumbarton, proposing a vote of thanks to the Chairman, said that Mr. Keillor was in the third generation of gas managers, like the speaker himself.

The PRESIDENT, in reply, expressed his thanks to the Secretary and members of Council for all the help they had given him in the discharge of his duties.

WARTIME ACTIVITIES IN AN INDUSTRIAL AREA

By ALEX. BUJNOWSKI,
M.C., Assoc.M.Inst.Gas E., A.M.I.H.V.E., M.Inst.F.,
Sales and Publicity Officer, Glasgow Corporation Gas Department

Paper to the North British Association of Gas Managers, April 4

FIRST I wish to express my sincere appreciation of the honour extended to me by the invitation to read a short Paper to this Association.

The war has presented the Gas Industry with innumerable avenues of service. Gas at all times meets every heating problem in the most efficient and economical manner. In Glasgow the Gas Department has made every effort to meet all demands. The purpose of this Paper is to indicate briefly some activities of the Department in this connexion which it is hoped will be interesting and useful.

The industrial heating field has grown to an unexpected limit. Here the applications have been new and varied. At the present time, as will be appreciated, it is not possible to give details of the various processes and adpatations. After the war the Industrial Heating Section will have a most interesting and useful story to tell, and further, give information which will be of immeasurable value to the Industry in the applications to peaceful purposes for many years to come.

Wartime Cookery

The outbreak of hostilities is normally attended by a cessation of any active sales policy. It was decided, however, to continue as far and as long as possible. The usual large demonstrations were given in the showrooms. The purpose was changed to a very definite "Service" policy—that of assisting the housewives with the present-day food problems. This was extraordinarily successful. It is most satisfactory to record that these demonstrations were attended by very high sales figures. The results may be seen from the accompanying chart.

This field was extended, and by co-operation with the Ministry of Food, Education Authorities, Women's Associations, Co-operative Societies, Rural Institutes, &c., a very large number of outside demonstrations was given. In some cases the demonstrator was provided by the Department, in others by the Education Authorities. The cost of these was exceptionally low.

The cooking facilities were provided by cookers which were fitted by heavy flexible tubing, ¾ in. dia. It will be appreciated that this enabled the cookers to be connected and disconnected very quickly. A further use for this flexible tubing has been the ability to provide cooking or heating facilities with the greatest possible speed for innumerable purposes since the outbreak of war.

During 1940 approximately 100 demonstrations were given and were attended by approximately 12,000 ladies.

Wartime Street Lighting

The Specification BS/ARP37 requires that the illumination on a horizontal surface at road level be 0.0002 ft. candle. It is difficult to ensure complete uniformity, but the general illumination should nowhere exceed 0.0004 ft. candle. It also requires that the light be white, such as provided by the ordinary gas mantle.

The necessity of blackout must be appreciated by all as a vital factor of defence against attack from the air. This requirement, while necessary, adds considerable strain to all classes of road users, and unfortunately also increases the number of accidents. There is a further, and most important, aspect to this restricted lighting—that is, the reduction of the many necessary phases of social activity, and also education.

It was quite possible, and very desirable, that gas could meet this need, but equally necessary that the existing installations and standards be adapted to the new modified requirement. For a considerable time certain lighting authorities made no attempt to provide illumination, while others commenced in a modified way. It became quite obvious that if any service was to be given, the Department would have to demonstrate to these rather backward authorities the effect of this lighting. This was done, and in every case the demonstration proved so effective that the lighting areas were almost completely fitted.

The effect on the street lighting load may be seen from the following figures:

COMPARATIVE STATEMENT OF STREET LIGHTING.

	1938/39. cu.ft.	1939/40. cu.ft.	Estimated 1940/41. cu.ft.
Annual Load (Glasgow)	288,270,797	42,126,320	117,997,130
" " (Supplementary Areas)	86,979,666	11,541,367	8,176,985
	375,250,463	53,667,687	126,174,115
Decrease due to War (Glasgow) ...	—	246,144,477	170,273,667
" " (Supplementary Areas) ...	—	75,438,299	78,802,681
		321,582,776	249,076,348

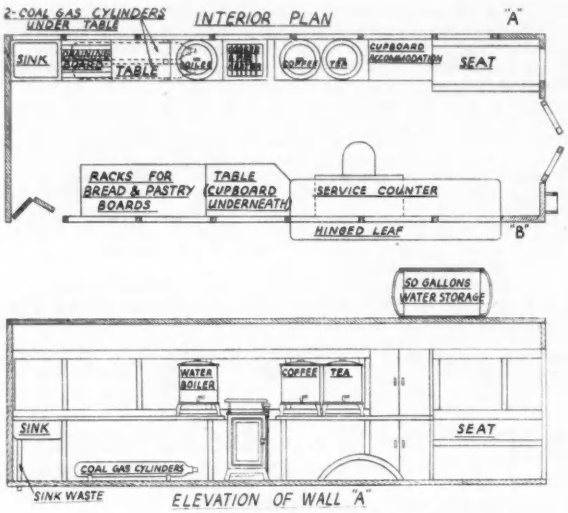
	In use. Number of Lamps.		
	1938/39.	1939/40.	1/3/41.
Glasgow	14,811	1,581	10,776
Supplementary Areas ...	5,626	14	1,068
	20,437	1,595	11,844

From these figures it will be seen that 34% of the street lighting load has been recovered and 58% of the lamps are in use.

Mobile Canteens

The need for mobile canteens for the many purposes required during the present emergency affords yet another avenue of service. The primary function of these was to provide food and hot drinks to special workers during a blitz.

A design was prepared by the Department which utilized a motor bus specially altered for the purpose. A copper urn with gas ring and a small gas cooker were fitted. In addition two thermo urns were installed to keep the drinks hot. A water tank of 50 gallons capacity was fitted on the roof, which supplied the urn and sink. The general arrangement is shown on the plan. Gas was supplied from cylinders. Pressure is reduced in two stages by using high pressure and low pressure governors. This, of course, only gives a limited use. However, a supply may also be taken by means of flexible connexions provided in each canteen which may be connected to any suitable gas point and gas taken from the mains, or, if need be, from a



Glasgow Mobile Canteen.

consumer's premises. These canteens are in use at the docks, wardens' posts, &c., with considerable success.

This method of connecting mobile units has been in operation in Glasgow for some years with coffee stalls, but the present introduction of compressed gas affords greater mobility, and also the ability to have the appliances in operation while travelling to the required site.

Blood Transfusion

As a result of the war the blood transfusion schemes were considerably extended. Formerly the practice was to take the blood from the donor and transmit this directly to the patient. In event of an emergency such as has been experienced such a method is far from satisfactory and methods of storing blood were sought.

In order that the blood may be kept in a satisfactory condition it must be maintained at a temperature between 2° and 4°C. (35.6° to 39.2° F.) If this can be done there is no growth of organism, and further it retards any destruction of the blood. Gas refrigerators met this requirement most efficiently. By this means of preservation blood has been kept for as long as three weeks, though the ideal period for storage is one week.

There are several features which recommend gas refrigerators for this purpose. First, in event of a failure of supply it takes approximately ten hours for the inside temperature of the cabinet to rise above the safe limit. Secondly, the actual temperature in the cabinet is very uniform, which is particularly desirable, as against the alternate rising and falling which might be occasioned by other types of refrigerator.

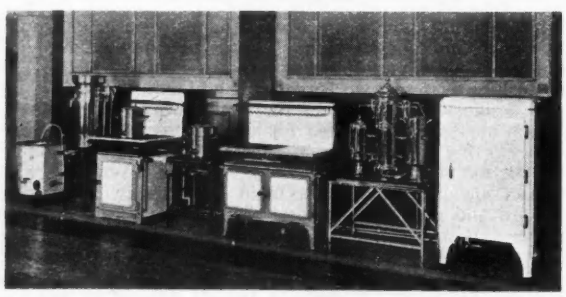
Every Glasgow hospital where a blood bank is maintained uses gas refrigerators for the storage. These are normally connected to the mains supply, but in addition a cylinder of compressed gas is provided with the required reducing valves which can be used and preserve the blood condition for quite a considerable time.

Emergency Kitchens

A further avenue of service which any gas undertaking may apply is the provision of cooking facilities complete to the local authority for use in an emergency. In every showroom there are some appliances. These should be connected and ready for use, in order that the required service may be given. This need may fall on us at any time.

The principal showrooms of the Glasgow Corporation Gas Department have a complete range of apparatus installed, which is capable of cooking for some hundreds. One installation is shown in the photograph. These appliances are connected in the ordinary way to the mains. In addition, however, a supply of gas in cylinders is maintained in reserve. Also some coke appliances are available.

This service was carried a stage further and supplies of food were stocked at the two principal showrooms. This was utilized to provide meals for the men of the Department engaged on the recent repair work.



Emergency Cooking Equipment in the Central Showrooms, Glasgow.

Gas for Transport

Shortly after the outbreak of hostilities the Transport and Gas Committees of Glasgow Corporation decided to proceed with the application of gas for transport. No compressor was available, but one is on order, and delivery is expected at an early date. Facilities are available for compressing gas in Glasgow so that the work is proceeding. A filling station has been installed at the main Corporation Bus Garage. A series of tests has been made and the results of these to date are proving interesting and satisfactory. Details of these are given below:

1. *Type of Bus Employed in Experiment.*

A.E.C. double-deck compression ignition engined bus. Unladen weight, 6 tons 13 cwt. The gas-bag is housed on the upper deck, which reduces the seating accommodation. High pressure cylinders will allow the full seating capacity to be maintained. In the single-deck bus the bag is arranged on the roof.

2. *Horse-power of Bus.*

R.A.C. rating, 41 h.p. Developed b.h.p. 90 at 1,750 r.p.m., running as a compression ignition engine on fuel oil.

3. *Main Alterations Required* are:

(*a*) Change of pistons to reduce compression ratio from 15 to 1 to 10 to 1.

(*b*) Fitting of a coil ignition unit in place of fuel injection pump.

(*c*) Replacement of injectors by sparking plugs.

4. *Details of Carburetter.*

Supplied by G. A. Mangoletsi, M.I.M.T., Manchester. The carburetter is fitted with adjustable valves controlling gas and air flow. Gas is admitted to mixing chamber through two lightly spring-loaded automatic poppet valves, which close when engine is at rest. When optimum gas and air settings are obtained, the carburetter is controlled in a similar manner to the petrol engine.

5. *Lubrication.*

The engine is lubricated with ordinary engine oil. Idling pressure 30 lb. per sq.in., and maximum pressure 65 lb. per sq.in.

6. *Ignition.*

Coil ignition distributor unit of standard commercial type.

7. *Fuel/Power Comparison.*

On a volumetric basis the ratio of energy liberated on combustion is as follows:

Air/Petrol Mixture . .	45.4
Air/Gas „ . .	38.6

This shows an advantage in favour of petrol. However, this is more than offset by the relative costs.

270 cu.ft. of Glasgow gas are equivalent to 1 gallon of petrol. Gas is supplied in this case at 4.894 pence per therm. Petrol in bulk may be taken at 1s. 8d. per gallon.

I think it must be borne in mind that the engines used in the

application of gas for motive purposes were all designed for use with either fuel oil or petrol. The characteristics of these fuels differ quite considerably from those of town gas. When we have engines specially designed for the use of gas, then the many advantages and economies already in evidence will be very greatly increased.

One bus under test carried 690 cu.ft. of gas in the bag, and the range was 11.5 miles, or a consumption of 60 cu.ft. of gas per mile. This compares very well with figures obtained from Manchester, where they are obtaining 54 cu.ft. of gas per mile for a single-deck vehicle. The engine ran very sweetly on gas.

These experiments are continuing, and shortly it is hoped that compressed gas may be applied and the application extended to general service conditions. In addition negotiations are in hand with a number of business firms in the area who have delivery vans, and who are arranging to have bags super-imposed to be filled up at the filling stations being arranged throughout the gas area.

The use of compressed gas has greatly increased the availability and flexibility of the applications. Compression has come to stay. Then again a new field of gas for power has been opened up by the adoption of gas to internal combustion engines. This aspect of utilization may have been neglected in the past, but there is always a future which will be anticipated with hope and complete confidence.

I have endeavoured briefly to indicate some of the activities in Glasgow. Many of these will be the subject of very full and informative Papers at a later date. There are, however, some features being revealed by present experiences which might well be borne in mind for the future days of peace.

Discussion

The PRESIDENT (Mr. R. D. Keillor) said that in some towns they had already begun to convert concrete mixers and similar plant. He had studied this subject some ten years ago and recalled that one of the features then was the question of detonation. Could anything be introduced along with the gas to prevent this? The question of pre-ignition was very important, and if they could cut this tendency out it would be possible to use storage of gas in a better way.

Mr. P. J. LUCAS, Secretary of the British Commercial Gas Association, said that Mr. Bujnowski's Paper was a record of development in Glasgow and showed quite plainly that the Gas Industry was faced with strenuous wartime problems, and that Glasgow was vigilant to see that gas was introduced wherever it could be profitably employed. With regard to the B.C.G.A., they knew there was now no national newspaper propaganda and they were holding no conferences or public meetings. These activities had a direct bearing on the moulding of public opinion with regard to the use of gas and definitely impressed the public with the magnitude of the Gas Industry. As an Association they were trying to keep the public and the official mind informed regarding what gas could do to solve wartime problems and to help in post-war reconstruction. Mr. Bujnowski had touched on the food question. That was a subject of the utmost importance to the Gas Industry. It would loom larger and larger as something that would play an important part in the winning of the war. It had therefore been the primary job of the B.C.G.A. to maintain contact with the Ministry of Food, and the Ministry was highly appreciative of the support given by the Gas Industry in the food campaign. The Ministry had praised the demonstrations given in gas showrooms and had expressed the hope that this work would continue and develop. It was hoped that both gas and electricity would identify themselves with the Ministry's own demonstrations. The B.C.G.A. proposed to send a communication regarding this co-operation to all members. If local undertakings could provide the necessary facilities and supply an audience they would have access to the Ministry's own panel of speakers. They wanted every showroom to be a depot for giving advice on food questions to the public. He was not sure of the position regarding community feeding in Scotland, but the Ministry hoped the Gas Industry would play its part there also. There had been an impression among local authorities that solid fuel alone should be used at feeding centres, but the B.C.G.A. was sending out a letter to say that gas could also be used. Solid fuel was used only if a grant had to be obtained.

Mr. S. SMITH said he was interested in what Mr. Bujnowski had to say regarding the use of gas for transport. He would like to know what it cost to get the gas in cylinders. He had himself gone to a certain firm in Glasgow and had been quoted 46s. per 1,000 cu.ft. He would also like to get some idea of the cost of converting a bus engine to gas. With the diesel type of engine this process was bound to be expensive.

Mr. W. KIRK, Motherwell, said that the subject matter of the Paper was topical. The provision of mobile canteens, large-scale cooking apparatus, and gas for traction were matters of paramount importance. There was no need for him to stress how far-reaching was the effect of a good hot meal on the public morale, specially following a "blitz," nor did he need to emphasize the saving in foreign exchange which could be accomplished by using gas in place of petrol. To the small coterie who had persevered during the past ten years or so with their experiments on gas as a substitute for petrol they ought to give thanks. It must have been heart-breaking work to continue with their experiments when petrol was at its cheapest.

The data given regarding gas for transport were most interesting, but the very limited application of the gas-bag suggested that the greatest field of service was to be found in using compressed gas in steel cylinders. The present make of cylinder was far too heavy, and research should be intensified to perfect a cylinder capable of withstanding high pressures but weighing only a few pounds. Present legislation imposed some onerous conditions—*e.g.*, the testing of cylinders, masking, and so forth—and this was a retarding factor to the use of gas. In his view the development of the business lay in making every undertaking a distributive centre where a motorist could drive in and replace an empty cylinder with a full one. The empty cylinder would then be refilled at a central works. The question of overcoming the difficult calorific values obtaining in various districts was a mechanical one and should be easily overcome. A further retarding influence was the cost of a compressing plant; and bearing this in mind, it was not to be wondered at that many undertakings had not gone ahead and installed plants. Another factor was that the gas should be debenzolized before compression. This was more or less forgotten in the preliminary estimates, thus again adding to the actual cost.

When seeking powers for new ventures nebulous loads were not looked upon favourably by Committees, and that was the position at the moment. Looking, however, at the potential market, he estimated that the petrol consumption was something like 2,000 million gallons a year. If they could capture, say, 10% of this market the additional gas required would be in the region of 54,000 million cu.ft. and at 17,000 cu.ft. per ton some 3 million tons of coal would be needed. Allowing the price of petrol to be 1s. per gallon entering the country, then £10,000,000 of foreign exchange could be saved. He noticed that the compression ratio had been reduced from 15–1 to 10–1, and he wondered why Dr. J. S. Clarke, of Birmingham Gas Department, had reported that an increase in compression ratio from 7–1 to 15–1 was advantageous and reduced the gas consumption by 30%.

Mr. Kirk said he noted with pleasure the remarks upon showroom demonstrations. The average attendances were encouraging and the sponsors should be congratulated on their enterprise. His Committee in Motherwell were at the moment considering the utilization of an empty shop adjacent to the showroom for similar demonstrations in conjunction with the Ministry of Food and the Education Authorities. He wished to know if the recent truce declared on propaganda was now a dead letter.

Sales in Motherwell area had received a set-back, understandable when one realized that the three and five years' hire-purchase facilities had been withdrawn. Eighty per cent. of the hire-purchase business was on those terms. Their two years' hire-purchase scheme was still operating, as he calculated that the level of wages at the end of hostilities would be maintained for nearly two years after. Agreements entered into prior to the war finishing would stand every chance of being met.

Replying, Mr. BUJNOWSKI said when they altered the compression ratio from 15–1 to 10–1 it was as far as they could go at the moment. In their mobile canteens they also had appliances for coke-burning.

Mr. DAVID FULTON, Helensburgh, proposed votes of thanks to Mr. Bujnowski and to the President.

Supplanting German Apparatus

New developments in scientific instruments and apparatus are announced in a series of leaflets just issued by Griffin & Tatlock, Ltd., Kemble Street, London, W.C. 2, who have sent us a list of some 20 items of British-made apparatus now available to take the place of those formerly supplied largely or exclusively by Germany. The Babcock fuel sampler has been developed to make more accurate the selection of a representative sample from crushed or powdered homogeneous substances. Devised primarily for use in the sampling of coal, it is equally applicable to any other freely-running material. Further improvements have been made recently in the design and construction of the Microid gas generator, which is now claimed to be the best gas generator for routine use yet put into production. Other points from the leaflets are that the many new types of high vacuum pumps and gauges now in production are no less efficient than the German types which they replace, and that standard ground glass joint apparatus is carried in stock in great variety. A new price list of chemical apparatus listed in catalogue 15B has been issued, superseding the June, 1940, list, which should be discarded. Customers are urged to quote on their orders their Government Contract (Priority) numbers if available to facilitate the obtaining of supplies of materials which might otherwise be withheld.

Gibbons (Dudley) Ltd.

A net profit of £24,835 for the year ended Dec. 31, 1940, was reported at the annual meeting of Gibbons (Dudley), Ltd., on April 2. A preference dividend of 7%, free of tax, had already been paid, and the meeting declared a dividend of 10% on the ordinary shares, plus a bonus of 2½%, leaving a balance of £14,741 to be carried forward.

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Gas Products Prices

The London Market

April 14.

Current Prices of Tar Products in the London Market are as follows: Pitch is nominal; creosote 4¾d. to 5d. per gallon; refined tar 3¾d. to 4d.; pure toluene under the Ministry of Supply Toluene No. 2 Order is 2s. 5d.; pure benzole is 1s. 10d.; 95/160 solvent naphtha 2s. 4d. to 2s. 6d.; and 90/160 pyridine about 13s. 6d.; all per gallon naked; refined crystal naphthalene £23 per ton in bags; all *ex* Makers' Works.

The Provinces

April 14.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 1s. 10d. (controlled by the Control of Toluene No. 2 Order, July 5, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 10d. to 11d. Solvent naphtha, naked, North, 1s. 9d. to 1s. 10d. Heavy naphtha North, 1s. 6d. to 1s. 7½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4½d. to 4¾d.; Scotland, 4½d. to 4¾d.; low gravity, 4½d. to 4¾d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's, 3s. 7½d. to 3s. 9d. Naphthalene, £12 to £15. Salts, 70s. to 80s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil (min. gr. 1,080), 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note in our issue of Sept. 4, 1940, p. 404.

Tar Products in Scotland

GLASGOW, April 12.

Prices generally continue satisfactory with throughput well maintained.

Refined tar is expected to be quite active with home prices at 4½d. to 4¾d. per gallon. Export business is still being conducted at 3¼d. to 3½d. per gallon, both f.o.r. naked.

Creosote oil is moving rapidly at the following prices: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6d. to 6½d. per gallon; neutral oil, 5¾d. to 6d. per gallon; all *ex* Works in bulk.

Cresylic acid: The demand continues and prices are firm as follows: Pale, 99/100%, 2s. 3d. to 2s. 5d. per gallon; Pale, 97/99%, 2s. 2d. to 2s. 4d. per gallon; Dark, 97/99%, 1s. 10d. to 2s. per gallon; all *ex* Works in buyers' packages.

Crude naphtha is well looked after at round 6¼d. to 7½d. per gallon *ex* Works in bulk, according to quality.

Solvent naphtha: 90/160 grade is 1s. 8½d. to 1s. 9d. per gallon and 90/190 Heavy Naphtha is 1s. 4½d. to 1s. 5½d. per gallon.

Pyridines are still inactive at round 15s. per gallon for 90/160 grade and 17s. per gallon for 90/140 grade.

Gas Stocks and Shares

The Stock Exchange gave the Budget a good reception, and at the opening on Tuesday prices showed a general advance, especially in the Funds. Among industrials, brewery and tobacco shares, in the absence of any further additions to duties, were outstanding features. Towards the close, however, the news of the fall of Salonika caused dealers to mark down prices all round. This had the effect of keeping off would-be sellers, but markets generally displayed a dull tone.

The volume of business in the Gas Market was quite good for a short week, particularly on Thursday, and it will be seen in the tables below that although there were few price changes the majority of these were in an upward direction. Gas Light units were well supported, and the price finally closed 3d. higher at 10s. 3d., business at one time being recorded up to 10s. 9d. On the Provincial Exchanges Newcastle units and Bristol ordinary also improved. Most of the other changes, as in the previous week, affected fixed interest stocks, and were headed by the sharp rise of 7 points in Southampton 5% debenture to 99½ in the Supplementary List, the stock changing hands at 99.

The Industry will have noted that in the course of his Budget statement the Chancellor of the Exchequer intimated that it was his intention, in order to prevent further rises in the cost of living, to include in his policy of stabilization a restriction on the increase in the prices of coal and gas and also electricity charges.

The following were the price movements recorded last week:

OFFICIAL LIST

Bournemouth, 4 p.c. Deb.	88—93	+1
Commercial Ord.	27—32	—1
Gas Light & Coke Ord.	9 9—10 9	+3d.
Mid Southern Utility, 4 p.c. Pref.	73—78	+3
South Suburban, 5 p.c. Deb.	95—100	+2
Wandsworth Cons. (*x.d.*)	63—88	Apl. 7
,, 4 p.c. Pref. (*x.d.*)	60—55	,, 7

SUPPLEMENTARY LIST

Croydon, 4 p.c. Pref.	68—73	—2
Southampton, 5 p.c. Red. Deb.	97—102	+7
Uxbridge, 5 p.c. Deb.	95—100	+5

PROVINCIAL EXCHANGES

Bristol Ord.	86—88	+2
Newcastle & Gateshead Ord.	17/6—18/6	+6d.
Newport (Mon.) Ord.	86—89	—2

A.R.P.

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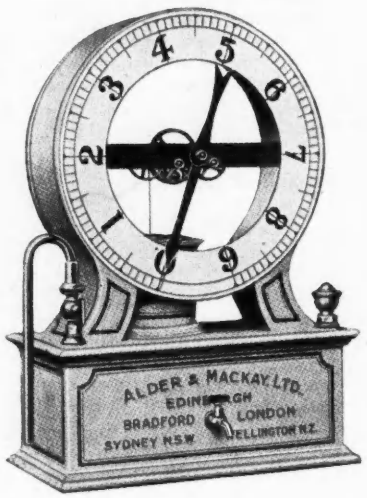

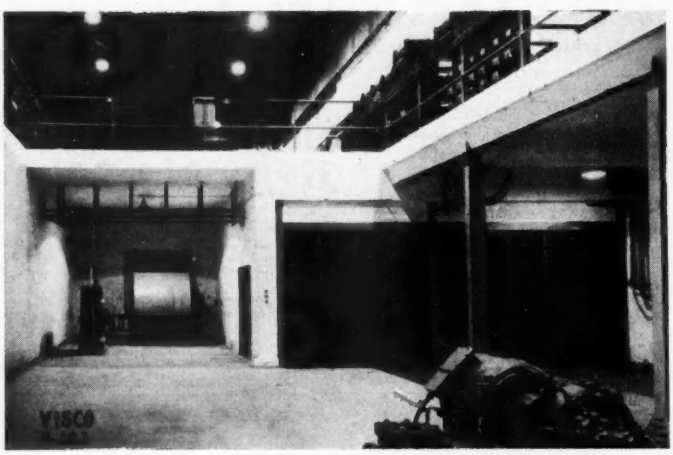

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